

Update on Strategies to Reduce Near Roadway Air Pollution Exposure

(Item #16-1-5)

January 21, 2016

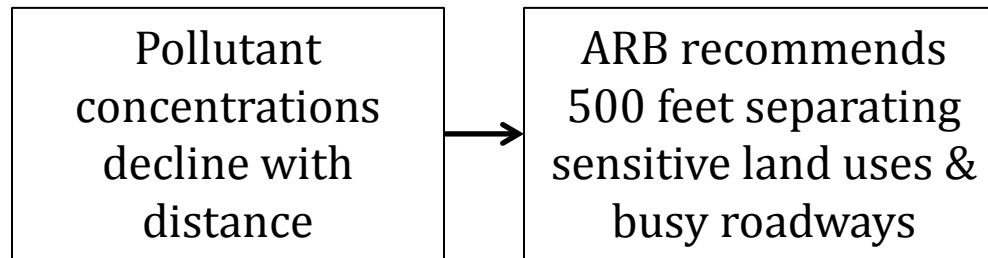


Public Health and Land Use

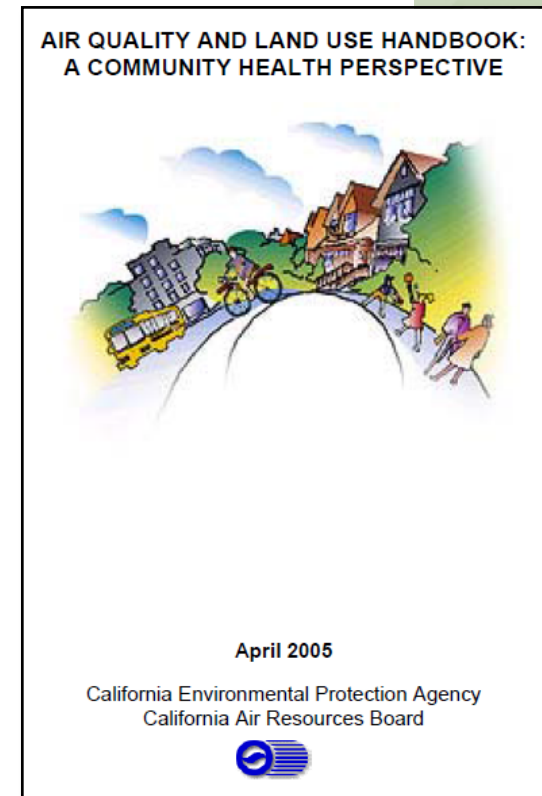
- Role of infill and compact development
 - Benefits: physical activity, greenhouse gas reduction, community connectivity
 - Challenge: increased exposure and health impacts close to roadways



Land Use Guidance



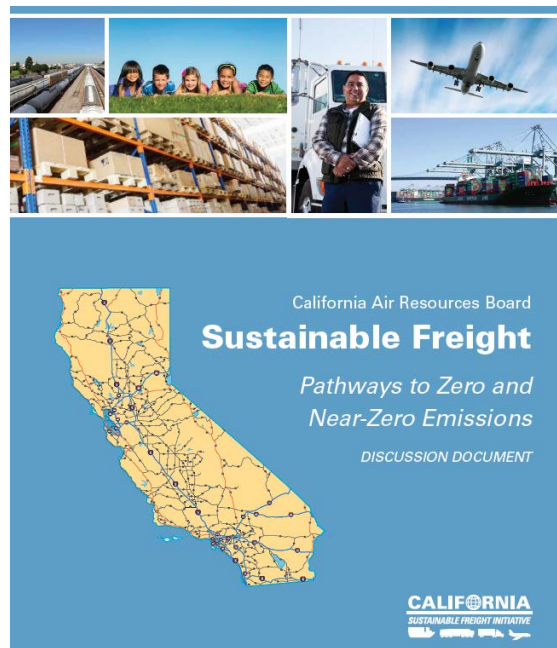
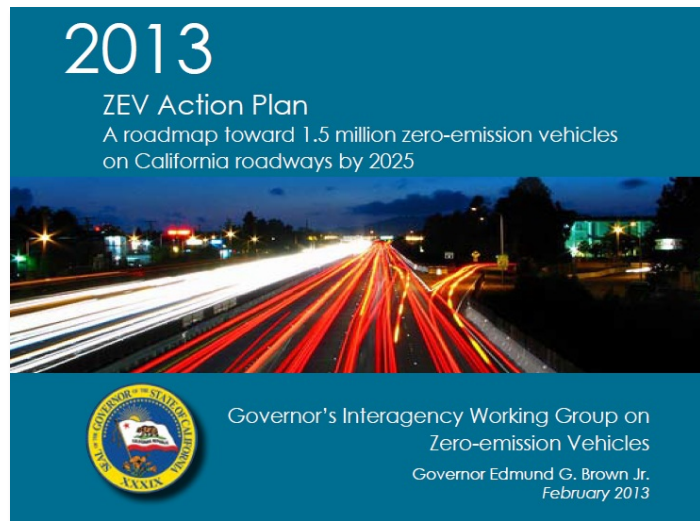
- ARB's Air Quality and Land Use Handbook
 - “Avoid siting new sensitive land uses within 500 feet of a freeways, urban roads with 100,000 vehicles/day, or rural roads with 50,000 vehicles/day.”¹



¹ <http://www.arb.ca.gov/ch/handbook.pdf>

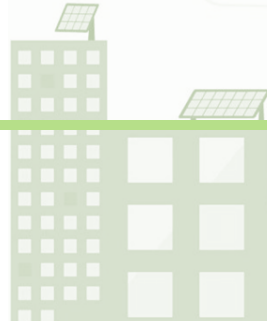
Role of the Changing Vehicle Fleet

- Existing policies and programs will help reduce tailpipe emissions, but:
 - other near-roadway pollution will remain and
 - measurable reductions will take time



Technical Advisory Recommendation

- **Strategies to reduce near roadway pollution exposure should be considered**
 - When developments exist or cannot be avoided within 500 feet of freeways, urban roads with 100,000 vehicles/day, or rural roads with 50,000 vehicles/day
 - When traffic pollution has prompted community concerns



Recommended Strategies: Background

- Goal: Create a Technical Advisory document for planners and other stakeholders containing:
 - Options for strategies that can be selected based on site/project-specific context
 - Scientific basis and other considerations (tradeoffs, appropriate context, etc.)
- Strategies will also appear in:
 - 2016 OPR General Plan Guidelines



8 Recommended Strategies

Urban Design

Roadside Features

Street Design and Traffic Management

Pollutant Removal

- Strategies are research-based
 - ARB-sponsored and outside research



Urban Design

1. Design that promotes ventilation along street corridors

- Better dispersion and air quality in street corridors characterized by:
 - buildings with varying shapes, heights, etc.
 - spaces that encourage air flow (e.g., parks, wider sidewalks and bike lanes)



ARB research projects:

- *Identifying urban designs and traffic management strategies for Southern California that reduce air pollution exposure*
- *Effects of complete streets on travel behavior and exposure to vehicular emissions*

Urban Design

2. Site office space, parking lots, and daytime uses closer to roads

- Pollutant concentrations decline with distance most sharply during the daytime



ARB research project:

- *Identifying urban designs and traffic management strategies for Southern California that reduce air pollution exposure*

Roadside Features

3. Solid barriers and sound walls adjacent to freeways

- Better vertical dispersion of pollutants
 - Magnitude/spatial extent of reduction depends on the height of the barrier, width of the road, and micrometeorology



ARB research project:

- *Effectiveness of sound wall-vegetation combination barriers as near-roadway pollutant mitigation strategies*

Roadside Features

4. Vegetation for pollutant dispersion

- Vegetation can alter pollutant transport and dispersion
 - *May* promote particle removal by diffusion and impaction



ARB research project:

- *Effectiveness of sound wall-vegetation combination barriers as near-roadway pollutant mitigation strategies*

Street Design & Traffic Management

5. Speed reduction mechanisms, including roundabouts

- Reduces stop-and-go driving
 - Roundabouts can reduce emissions (up to 85%)



Street Design & Traffic Management

6. Traffic signal management, including signal coordination

- Reduces stop-and-go driving and vehicle idling
 - Can reduce emissions (up to 50%)



Street Design & Traffic Management

7. Reduce speed limits to below 55 miles per hour on high speed roads

- Per-mile emissions rates & fuel consumption minimized in optimal average speed range of ~35-55 miles per hour



Pollutant Removal

8. Indoor high efficiency filtration (in buildings)

- High efficiency filters (in-building ventilation systems and portable air filters) can remove 50-99% of airborne particles



ARB research projects:

- *Benefits of high efficiency filtration to children with asthma*
- *Reducing in-home exposure to air pollution*

Use of Recommended Strategies

If 500 ft. separation is infeasible because:

Development is existing

OR

Project cannot achieve separation


















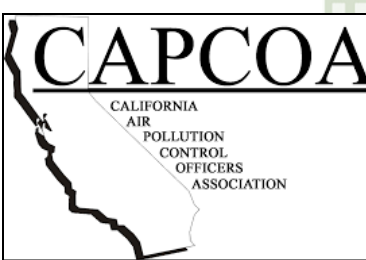
THEN

Recommended strategies to reduce near-roadway pollution exposure should be considered

- Local context and project-specific considerations are important
- Combinations of strategies usually optimize effectiveness
- Consult local and regional partners—such as air districts and metropolitan planning organizations—before implementing a strategy



Stakeholder and Expert Review

State Agencies	Academic	Federal Gov't	Int'l	Regional
      	    	 <p>Region 9 + Office of Research & Developm't</p>	   <p>Germany</p>  <p>Netherlands Nat'l Institute for Public Health & Environm't</p>	 <p>California Metropolitan Planning Organizations</p>

Office of Planning & Research (OPR)

General Plan Guidelines

- Widely distributed for public comment in 2015
- ARB's strategies listed and briefly described



Next Steps – Technical Advisory

- Finalize Technical Advisory based on the latest stakeholder review
- Make the Technical Advisory widely available
 - ARB web site, OPR General Plan Guidelines, list serve emails
- Continue coordinating with stakeholders and partners



Next Steps – Research

- Continue to research exposure hot spots
- Explore additional mitigation strategies
- Analyze the real-world effectiveness of combinations of strategies
- Continue coordinating with key partners on related research

